Method of Predictive Determination of Financial Investment Performance

FLOW CHART

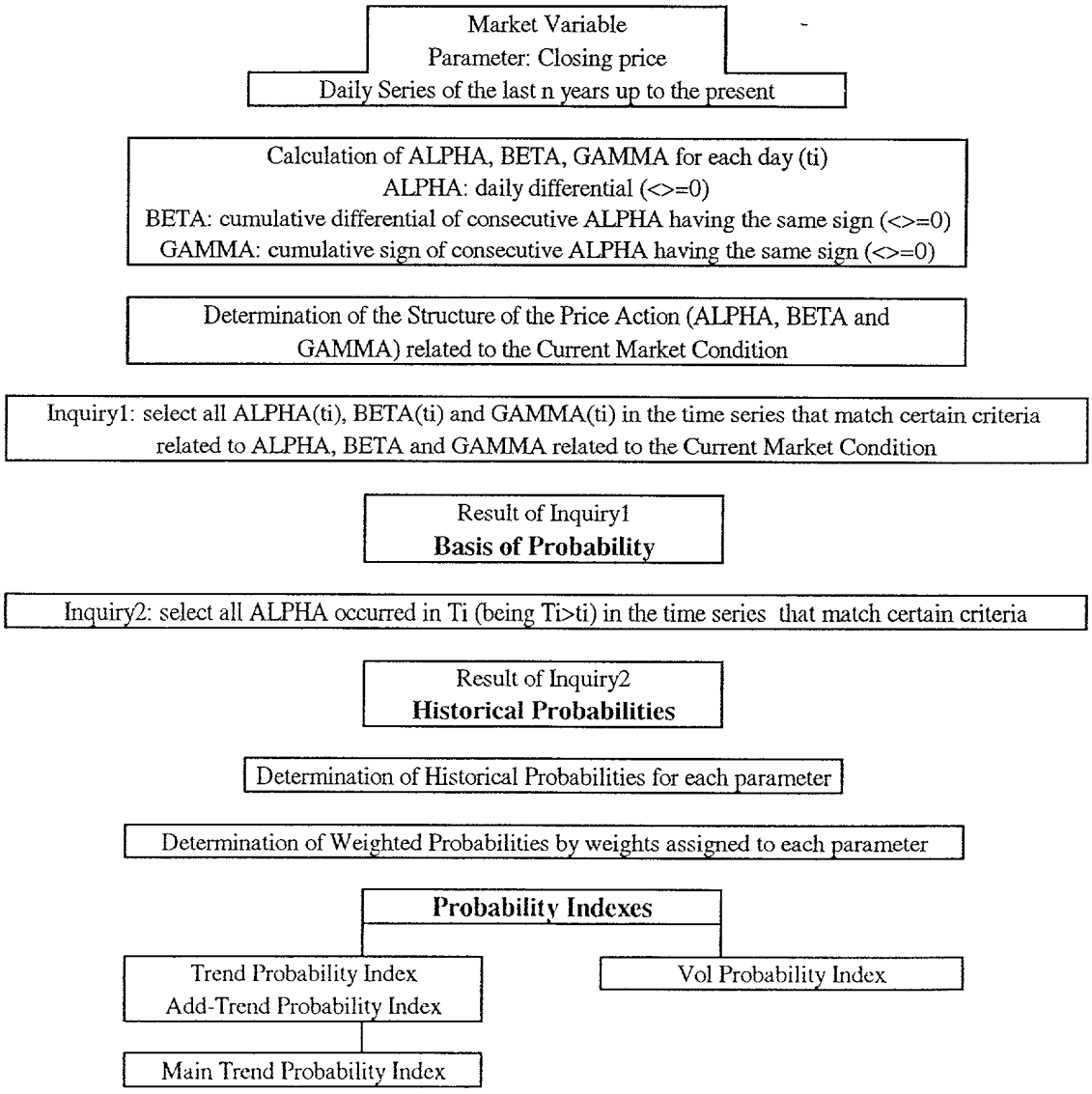

FIG. 1

US 6,317,728 B1

EXAMPLE

	date	price	ALPHA(ti)	BETA(ti)	GAMMA(ti)
1	12-Apr-00	55.00			
2	13-Apr-00	55.50	0.91	0.91	1up
3	14-Apr-00	55.80	0.54	1.45	2up
4	15-Apr-00	56.00	0.36	1.82	3up
5	16-Apr-00	55.80	-0.36	-0.36	1down
6	17-Apr-00	55.90	0.18	0.18	1up
7	18-Apr-00	55.50	-0.72	-0.72	1down
8	19-Apr-00	55.00	-0.90	-1.61	2down
9	20-Apr-00	54.00	-1.82	-3.40	3down
10	21-Apr-00	54.20	0.37	0.37	1up
11	22-Apr-00	54.00	-0.37	-0.37	1down
12	23-Apr-00	54.60	1.11	1.11	1up
13	24-Apr-00	55.00	0.73	1.85	2up
14	25-Apr-00	55.40	0.73	2.59	3up
15	26-Apr-00	55.20	-0.36	-0.36	1down
16	27-Apr-00	55.10	-0.18	-0.54	2down
17	28-Apr-00	54.90	-0.36	-0.90	3down
18	29-Apr-00	55.20	0.55	0.55	1up
19	30-Apr-00	55.60	0.72	1.28	2up
20	01-May-00	55.60	0.00	0.00	1unchanged
21	02-May-00	55.70	0.18	0.18	1up
22	03-May-00	55.80	0.18	0.36	2up
23	04-May-00	55.85	0.09	0.45	3up
24	05-May-00	55.40	-0.81	-0.81	1down
25	06-May-00	55.60	0.36	0.36	1up
26	**07-May-00**	**55.75**	**0.27**	**0.63**	**2up**
			ALPHA(t)*	**BETA(t)***	**GAMMA(t)***

ALPHA = daily differential (<>=0)
BETA = cumulative differential of consecutive ALPHA having the same sign (<>=0)
GAMMA = cumulative sign of consecutive ALPHA having the same sign (<>=0)

FIG. 2

TOHT90 "EHT28860

EXAMPLE

ALPHA(t)* = 0.27
BETA(t)* = 0.63
GAMMA(t)* = 2up

Locate values that correspond to occurrence of the following criteria, or that correspond to a plurality of the following criteria at the same time:

since ALPHA(t)* > 0

GAMMA(ti) >= GAMMA(t)*
ALPHA(ti) >=0
ALPHA(ti) >=0 and <= 0.27
ALPHA(ti) >= 0.27
ALPHA(ti) >= 0 and <= X1 — being:
ALPHA(ti) >= 0.27 and <= X1 — 0<X1<Y1
ALPHA(ti) >=X1 — 0<X2<Y2
ALPHA(ti) >=X1 and <= Y1
ALPHA(ti) >=Y1
BETA(ti) >=0
BETA(ti) >=0 and <=0.63
BETA(ti) >= 0.63
BETA(ti) >= 0 and <= X2
BETA(ti) >= 0.63 and <= X2
BETA(ti) >=X2
BETA(ti) >=X2 and <=Y2
BETA(ti) >=Y2

FIG. 3

EXAMPLE

step 1

Among a number of different criteria the user selects 3 of them:

GAMMA(ti)= GAMMA(t)*=2UP
ALPHA(ti)>= ALPHA(t)*=0.27
BETA(ti)>= BETA(t)*=0.63

In the time series, the following days match these criteria:

line #3	14-Apr-00
line # 13	24-Apr-00
line #19	30-Apr-00

Therefore, in the time series considered we find only 3 days matching all 3 criteria at the same time.

We selected 3 lines. X = 3.

step 2

Now we want to see what happened on the following day of these 3 days.

line #3	the day after the price went UP (see line #4).
line #13	the day after the price went UP (see line #14).
line #19	the day after the price remained UNCHANGED (see line #20).

In particular, we have:		ALPHA(ti+1)
line #4	15-Apr-00	0.36
line #14	25-Apr-00	0.73
line #20	01-May-00	0.00

Out of 3 possibilities,

UP occurred 2 times.
DOWN occurred 0 times
UNCHANGED occurred 1 time

	occurrences
positive variations	2
negative variations	0
zero variations	1
total	**3**

K = 2
J = 0
Y = 1 the sum of K, J and Y gives X = 3.

FIG. 4

EXAMPLE

step 3

Now, we calculate the ratios Pk, Pj and Py:

Pk = K/X*100 = 66.6%
Pj = J/X*100 = 0 being the sum of them equals to 100.
Py = Y/X*100 = 33.4%

As only 1 parameter has been considered, there in no need to weigh the probabilities.
Now we can calculate the **Trend Probability Index (TPI).**

TPI = max(Pk;Pj)+max(Pk;Pj)/100*Py*r*s being: s, r >0
TPI = 77.7 s=1 and r=0.5

As TPI is UP 77.7% it is more likely tomorrow an uptrend will take place.

step 4

Assuming we have done all previous steps for 4 parameters (High, Low, Close, Open), we have: (values are for example)

	Pk	Pj	Py	total
High	55.00	45.00	0.00	100.00
Low	66.00	30.00	4.00	100.00
Open	75.00	20.00	5.00	100.00
Close	52.00	48.00	0.00	100.00

now we assign a weight to each parameter:

	weights
High	25.00
Low	25.00
Open	10.00
Close	40.00

being each of them >=0 and the sum of them equals to 100.

Now we can weigh Pk, Pj and Py for the assigned weights:

	PK	PJ	PY	weights
High	13.75	11.25	0.00	25.00
Low	16.50	7.50	1.00	25.00
Open	7.50	2.00	0.50	10.00
Close	20.80	19.20	0.00	40.00
Total	**58.55**	**39.95**	**1.50**	100 00

The sum of Pk1, Pk2 and Pk3 gives **PK = 58.55**
The sum of Pj1, Pj2 and Pj3 gives **PJ = 39.95**
The sum of Py1, Py2 and Py3 gives **PY = 1.50**

The **Trend Probability Index (TPI)** can now be calculated.

TPI = max(Pk;Pj)+max(Pk;Pj)/100*Py*r*s being: s, r >0
TPI = 59.4 s=1 and r=1

As TPI is UP 59.4% it is more likely tomorrow an uptrend will take place.

FIG. 5

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GENERAL CRITERIA FOR SELECTION

for *each possible* ALPHA(t-n)*

1

being t the time of the Last Available Data and n=0, 1, 2....

ALPHA(t-n)* >= 0

GAMMA(ti-n) >= GAMMA(t-n)*

ALPHA(ti-n) >= X1 being:

X1<= ALPHA(ti-n) <= Y1 0<=X1<Y1

BETA(ti-n) >= X2 0<=X2<Y2

X2 <= BETA(ti-n) <= Y2

ALPHA(t-n)* <= 0

GAMMA(ti-n) <= GAMMA(t-n)*

ALPHA(ti-n) <= X1 being:

X1>= ALPHA(ti-n) >= Y1 0>=X1>Y1

BETA(ti-n) <= X2 0>=X2>Y2

X2 >= BETA(ti-n) >= Y2

FIG. 6

GENERAL CRITERIA FOR SELECTION

2

for *each possible* ALPHA(t-n)*

being t the time of the Last Available Data and n=0, 1, 2....

ALPHA(t-n)* >= 0

GAMMA(ti-n) >= GAMMA(t-n)*
ALPHA(ti-n) >=0
ALPHA(ti-n) >=0 and <=ALPHA(t-n)*
ALPHA(ti-n) >=ALPHA(t-n)*
ALPHA(ti-n) >= 0 and <= X1 — being:
ALPHA(ti-n) >= ALPHA(t-n)* and <= X1 — 0<X1<Y1
ALPHA(ti-n) >=X1 — 0<X2<Y2
ALPHA(ti-n) >=X1 and <= Y1
ALPHA(ti-n) >=Y1
BETA(ti-n) >=0
BETA(ti-n) >=0 and <=BETA(t-n)*
BETA(ti-n) >=BETA(t-n)*
BETA(ti-n) >= 0 and <= X2
BETA(ti-n) >= BETA(t-n)* and <= X2
BETA(ti-n) >=X2
BETA(ti-n) >=X2 and <= Y2
BETA(ti-n) >=Y2

ALPHA(t-n)* <= 0

GAMMA(ti-n) <= GAMMA(t-n)*
ALPHA(ti-n) <=0
ALPHA(ti-n) <=0 and >=ALPHA(t-n)*
ALPHA(ti-n) <=ALPHA(t-n)*
ALPHA(ti-n) <= 0 and >= X1 — being:
ALPHA(ti-n) <= ALPHA(t-n)* and >= X1 — 0>X1>Y1
ALPHA(ti-n) <=X1 — 0>X2>Y2
ALPHA(ti-n) <=X1 and >= Y1
ALPHA(ti-n) <=Y1
BETA(ti-n) <=0
BETA(ti-n) <=0 and >= BETA(t-n)*
BETA(ti-n) <=BETA(t-n)*
BETA(ti-n) <= 0 and >= X2
BETA(ti-n) <= BETA(t-n)* and >= X2
BETA(ti-n) <=X2
BETA(ti-n) <=X2 and >= Y2
BETA(ti-n) <=Y2

FIG. 7

PARAMETERS TO BE USED FOR THE TIME SERIES

TIME UNIT = ti

		parameter	DESCRIPTION In the time unit, the value of each parameter is equivalent to the following:
1	1	MAX	the highest value
2	2	MIN	the lowest value
3	3	OPEN	the first value
4	4	CLOSE	the last value
5	5	MID	(MAX+MIN)/2
6	6	CLOP	(OPEN+CLOSE)/2
7	7	MICLO	(MIN+CLOSE)/2
8	8	MACLO	(MAX+CLOSE)/2
9	9	MIDCLO	(MID+CLOSE)/2
10	10	OPMAX	(MAX+OPEN)/2
11	11	OPMIN	(OPEN+MIN)/2
12	12	MAXMID	(MAX+MID)/2
13	13	MINMID	(MID+MIN)/2
14	14	MIDCLOP	(MID+CLOP)/2

The above-listed parameters are defined THE TREND PARAMETERS, as a whole.

hereinafter, ti-1 is defined as the period of time immediately previuos period t.

by definition, ti-1 is as long as ti.

15	1	CLOSEOPEN	the value consistent with the output resulting from the following: ((OPEN(ti)-CLOSE(ti-1))/CLOSE(ti-1))*100
16	2	MIDOPEN	the value consistent with the output resulting from the following: ((OPEN(ti)-MID(ti-1))/MID(ti-1))*100
17	3	CLOPOPEN	the value consistent with the output resulting from the following: ((OPEN(ti)-CLOP(ti-1))/CLOP(ti-1))*100
18	4	MIDCLOPEN	the value consistent with the output resulting from the following: ((OPEN(ti)-MIDCLO(ti-1))/MIDCLO(ti-1))*100
19	5	MIDCLOPOPEN	the value consistent with the output resulting from the following: ((OPEN(ti)-MIDCLOP(ti-1))/MIDCLOP(ti-1))*100
20	6	MIDCLOSE	the value consistent with the output resulting from the following: ((CLOSE(ti)-MID(ti-1))/MID(ti-1))*100
21	7	CLOPCLOSE	the value consistent with the output resulting from the following: ((CLOSE(ti)-CLOP(ti-1))/CLOP(ti-1))*100
22	8	MACLOCLOSE	the value consistent with the output resulting from the following: ((CLOSE(ti)-MACLO(ti-1))/MACLO(ti-1))*100
23	9	MICLOCLOSE	the value consistent with the output resulting from the following: ((CLOSE(ti)-MICLO(ti-1))/MICLO(ti-1))*100
24	10	MIDCLOCLOSE	the value consistent with the output resulting from the following: ((CLOSE(ti)-MIDCLO(ti-1))/MIDCLO(ti-1))*100
25	11	MIDCLOPCLOSE	the value consistent with the output resulting from the following: ((CLOSE(ti)-MIDCLOP(ti-1))/MIDCLOP(ti-1))*100
26	12	CLOSEMID	the value consistent with the output resulting from the following: ((MID(ti)-CLOSE(ti-1))/CLOSE(ti-1))*100
27	13	MACLOMID	the value consistent with the output resulting from the following. ((MID(ti)-MACLO(ti-1))/MACLO(ti-1))*100
28	14	MICLOMID	the value consistent with the output resulting from the following ((MID(ti)-MICLO(ti-1))/MICLO(ti-1))*100
29	15	MIDCLOMID	the value consistent with the output resulting from the following: ((MID(ti)-MIDCLO(ti-1))/MIDCLO(ti-1))*100
30	16	MIDCLOPMID	the value consistent with the output resulting from the following: ((MID(ti)-MIDCLOP(ti-1))/MIDCLOP(ti-1))*100

The above-listed parameters are defined **THE ADD-TREND PARAMETERS,** as a whole.

TABLE - FIG. 8 A

31	1	MA-OP	(MAX-OPEN)/OPMAX*100
32	2	OP-MI	(OPEN-MIN)/OPMIN*100
33	3	MA-MI	(MAX-MIN)/MID*100
34	4	MA-CL	(MAX-CLOSE)/MACLO*100
35	5	CL-MI	(CLOSE-MIN)/MICLO*100
36	6	OP-CL	the absolute value of((CLOSE-OPEN)/CLOP*100)

The above-listed parameters are defined THE VOLATILITY PARAMETERS, as a whole.

Number of Trend Parameters:	**14**
Number of Add-Trend Parameters	**16**
Number of Volatility Parameters:	**6**

Total number of parameters:	**36**

* * *

TABLE - FIG. 8 B

EXAMPLE

	date	price	A	B	C	D
1	12-Apr-00	55.00				
2	13-Apr-00	55.50	0.91			
3	14-Apr-00	**55.80**	**0.54**	1.45		
4	15-Apr-00	56.00	0.36	0.90	1.82	
5	16-Apr-00	55.80	-0.36	0.00	0.54	1.45
6	17-Apr-00	55.90	0.18	-0.18	0.18	0.72
7	18-Apr-00	55.50	-0.72	-0.54	-0.89	-0.54
8	19-Apr-00	55.00	-0.90	-1.61	-1.43	-1.79
9	20-Apr-00	54.00	-1.82	-2.70	-3.40	-3.23
10	21-Apr-00	54.20	0.37	-1.45	-2.34	-3.04
11	22-Apr-00	54.00	-0.37	0.00	-1.82	-2.70
12	23-Apr-00	54.60	1.11	0.74	1.11	-0.73
13	24-Apr-00	**55.00**	**0.73**	1.85	1.48	1.85
14	25-Apr-00	55.40	0.73	1.47	2.59	2.21
15	26-Apr-00	55.20	-0.36	0.36	1.10	2.22
16	27-Apr-00	55.10	-0.18	-0.54	0.18	0.92
17	28-Apr-00	54.90	-0.36	-0.54	-0.90	-0.18
18	29-Apr-00	55.20	0.55	0.18	0.00	-0.36
19	30-Apr-00	**55.60**	**0.72**	1.28	0.91	0.72
20	01-May-00	55.60	0.00	0.72	1.28	0.91
21	02-May-00	55.70	0.18	0.18	0.91	1.46
22	03-May-00	55.80	0.18	0.36	0.36	1.09
23	04-May-00	55.85	0.09	0.27	0.45	0.45
24	05-May-00	55.40	-0.81	-0.72	-0.54	-0.36
25	06-May-00	55.60	0.36	-0.45	-0.36	-0.18
26	07-May-00	55.75	0.27	0.63	-0.18	-0.09

In column A:
in regular printing, all values of ALPHA(ti)
in bold, all values selected according to the criteria related to ALPHA(t)*, BETA(t)*, GAMMA(t)*
in underlined, all values of ALPHA(ti+1) related to the selected values.

In column B.
in underlined, all values of ALPHA(ti+2) related to the selected values.
In column C.
in underlined, all values of ALPHA(ti+3) related to the selected values.
In column D:
in underlined, all values of ALPHA(ti+4) related to the selected values.

FIG. 9

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